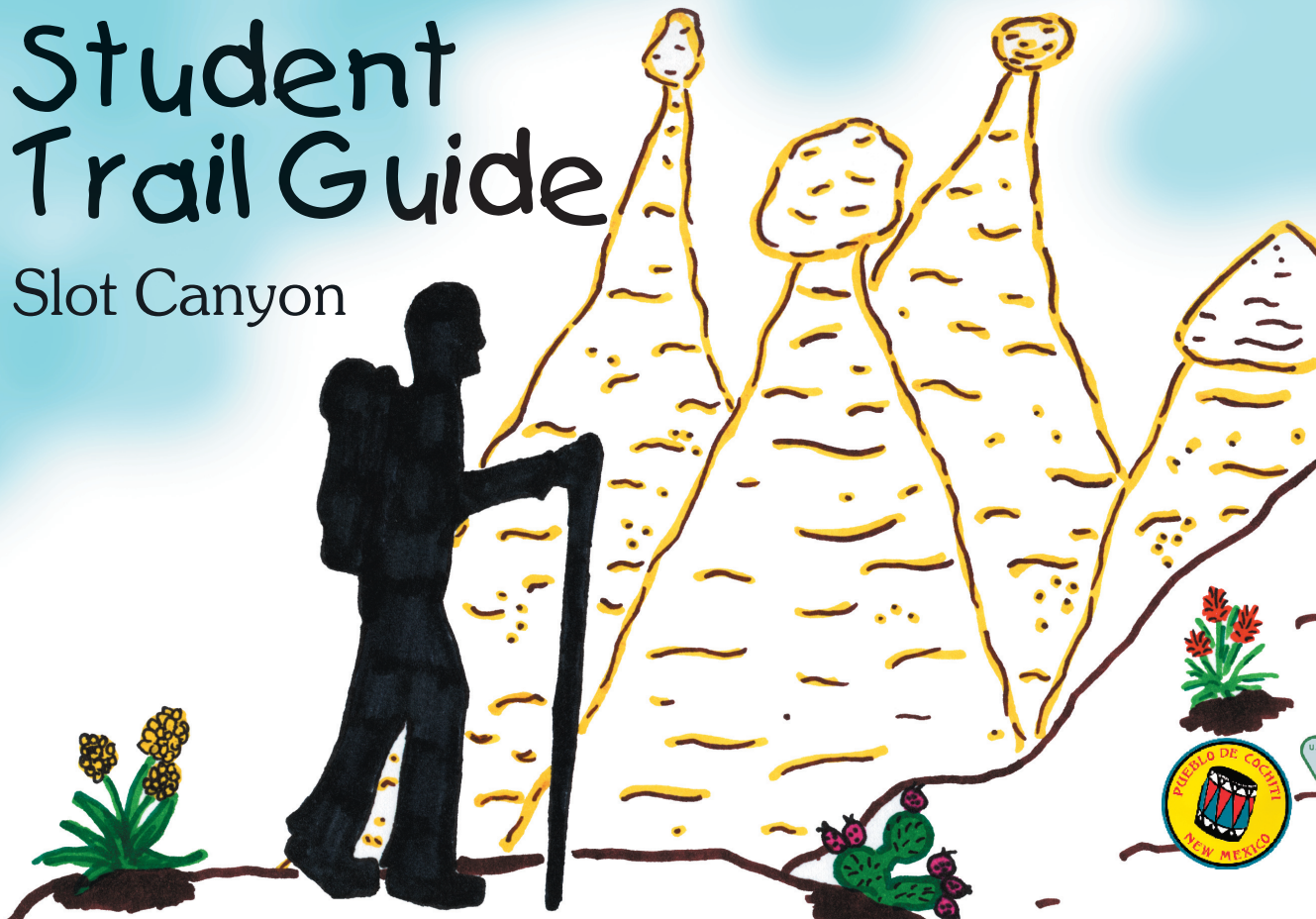


KASHA-KATUWE TENT ROCKS NATIONAL MONUMENT

Student Trail Guide

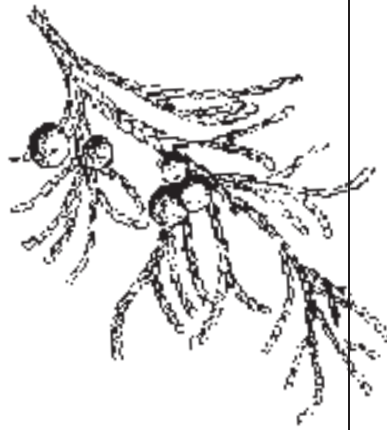
Slot Canyon



SC1. Dead piñons – What caused the trees to die?

There are many dead piñon pines in northern New Mexico. The short answer to why they're dying is the trees are being destroyed by attacks from tiny bark beetles called ips beetles. The longer answer is that several years of drought stressed the trees. When stressed, trees send out a special scent (pheromone signal) that attracts the beetles. In the wetter decade of the 1990's piñons spread beyond their natural range. With the drought of the early 2000's the piñons are retreating and grassland is returning to the area. This is the natural ebb and flow of plant life.





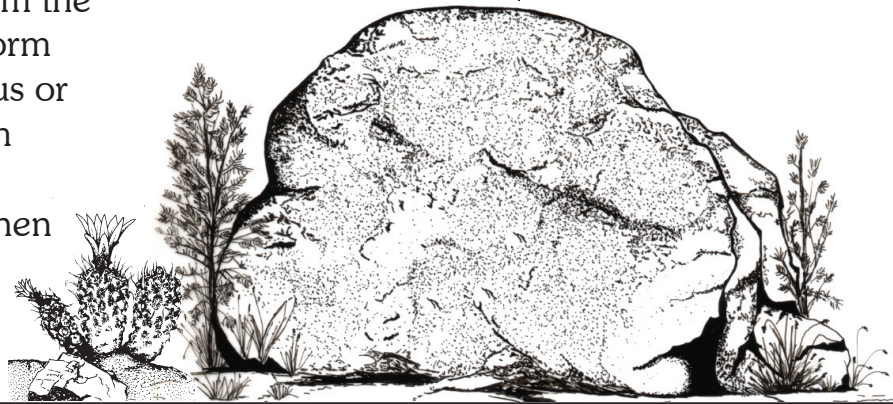
One-seed juniper

SC2. One-Seed juniper – What is this plant? How is adapted to the desert? How can it be used?

One-seed juniper (mono meaning one and sperma meaning seed) is a very large shrub that ranges in size from 6-20' tall with fine-textured waxy, scaly leaves which look somewhat like alligator skin. The waxy, scaly leaves reduce water loss, a benefit for desert plants where water is scarce. The females have blue berries that were used by Native Americans for medicinal purposes and food. The wood was used for bows and arrows, building material, fuel, and prayer sticks. The bark was used for a green dye, fibrous mats, and saddles. One seed junipers have an extensive root system that supports them and reduces soil loss where they grow.

SC3. Nurture plants (shrub live oak under one seed juniper on left side of trail) and nurture rocks– What is a nurture plant and what do they do?

See the shrub oak under the one seed juniper. The juniper is acting as a nurture plant or mother plant for the smaller oak. It's protecting the plant from nibbling animals and shading it from the hot sun. Rocks often perform a similar function for cactus or other plants, keeping them shaded, protected, and directing water to them when they're young.





Manzanita

SC4. Manzanita – Why is manzanita so unusual and how is it used?

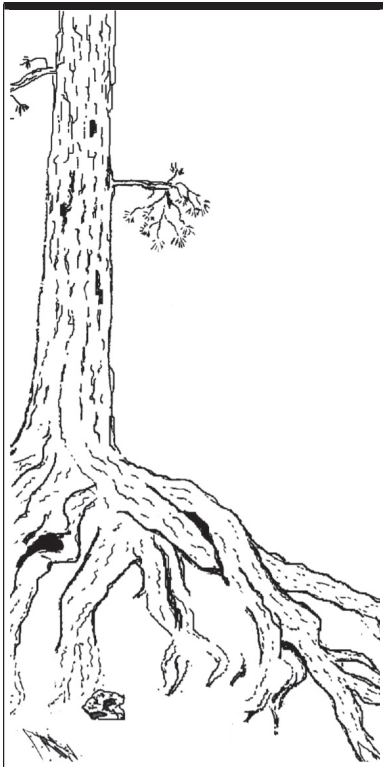
Manzanita is a beautiful evergreen shrub growing on the hillsides that's unique to this area. In the spring lovely light pink flowers bloom. The remainder of the year you can see shiny leathery leaves and cinnamon colored bark. Manzanita is difficult to grow so you don't see many of them in landscapes. To germinate, the seeds need fire, cold, and scratching that comes from wind rolling them over the ground. Native Americans used the wood for pipes and tools, the leaves for medicine, and the berries for food.

SC5. Ponderosa trunk – What does the trunk smell like?

Smell the bark of the ponderosa pine. Does it smell like vanilla?



Ponderosa pine

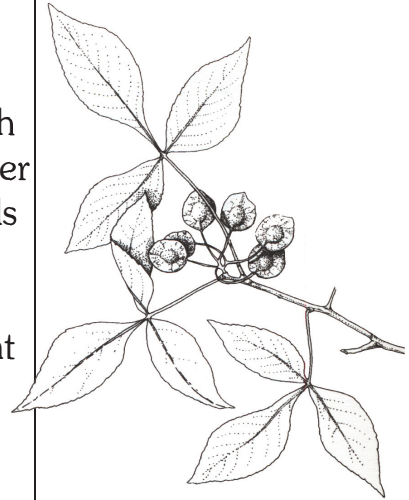


SC6. Ponderosa tree roots – How do roots work?

Roots circle the tree. All trees have multiple sizes of roots: large water and nutrient carrying roots closest to the trunk that lead into progressively smaller mats of tiny feeder roots at the farthest edge of the circle. The feeder roots can be found in a circle which is 2 to 5 times the tree canopy. These roots gather water from far away so the tree can survive. Some trees, like pines, also have a deep root below the trunk called a tap root. You are lucky to see all three types of roots on this Ponderosa pine. The tap root is the deep root underneath the trunk. The larger side roots are the nutrient carrying roots. Along the canyon wall look for smaller diameter roots which lead to the tiny feeder roots. Feeder roots capture water and minerals from the soil and provide them to the trunk and leaves (needles for pines).

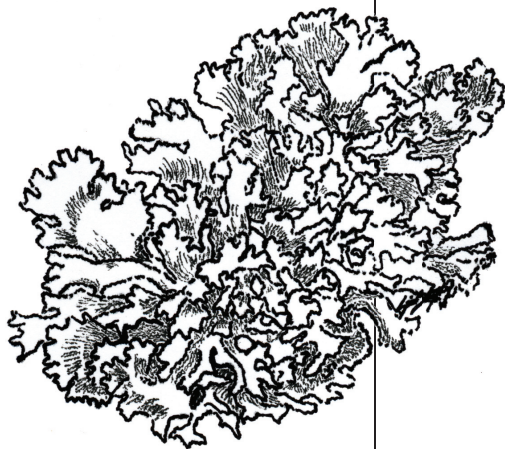
SC7. Cottonwoods, hop trees – How can these trees exist in the desert?

Generally in the desert you don't find very tall trees with large leaves. If you see them at all growing naturally, they'll be in river or stream areas. There's just not enough water to support big trees with large leaves. Because water is funneled into the canyon area and because the tall walls provide more shade from the sun, trees that need more water such as narrow leaf cottonwoods and hop trees are found in the canyon area. The shade reduces the amount of water loss for these trees. Smell the leaves of the hop tree (it has leaflets in threes). That's why they're named after hops, a grain crop used to make beer.



Cottonwood

SC8. Mosses and lichens – Why/when do mosses and lichen appear?



This wall contains moss. Mosses grow on rock where water is available. Notice that most of the mosses are soft, green and on shaded moist walls. Lichens grow on rocks where it's drier and come in various colors: yellow, orange, blue, gray, green, and black. They are made up of two life forms: algae within a fungus framework. Some lichens are thousands of years old and are very fragile. Lichens are pioneer life forms and open the way for more complex life forms to grow.

SC9. Mountain mahogany seeds – Why are the seeds of mountain mahogany shaped as they are?

In the fall, mountain mahogany puts out seed that look like small curly, white pieces of yarn. Mother Nature designed the seeds to spiral into the ground. Notice the small toothed edges of the leaves.



Mountain mahogany



SC10. Huge boulder blocks the trail – Where do the boulders come from?

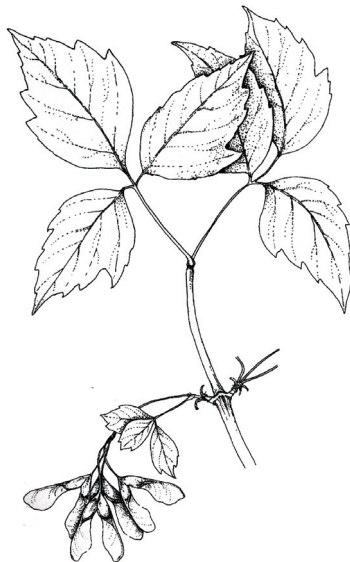
As the layers of volcanic ash erode huge boulders come loose and roll to the canyon floor. Also, boulders are formed from sections of the canyon wall that break free when cracks expand and contract with freezing and thawing water.

SC11. Bird nesting places high in the cliffs – Which birds use the nesting places high in the cliffs?

At the top of the cliffs are half moon cutouts formed by wind and water. Birds use these protected places for nesting. See if you can see the swifts, which fly in bursts and then sail on the wind. Swallows, kestrels, hawks, ravens, and even eagles use these as nesting places too.



Red-tail Hawk



Box elder

SC12. Box Elder – Have you seen any other Box Elders in the canyon?

The Box Elder is a tree related to the maple family. This is the only spot in the canyon where you can find one of these trees. This tree is not an evergreen so it does lose its leaves in the fall.

Can You Find These Animals and Plants Along the Trail?

- ☐ Turkey Vulture
- ☐ Red-tailed Hawk
- ☐ White-throated Swift
- ☐ Hairy Woodpecker
- ☐ Gray Flycatcher
- ☐ Western Scrub-Jay
- ☐ Common Raven
- ☐ Violet-green Sallow
- ☐ Canyon Wren
- ☐ Blue-gray Gnatcatcher
- ☐ Wilson's Warbler
(bright yellow)

- ☐ House Finch
- ☐ Hepatic Tanager (red)
- ☐ Chipping Sparrow
- ☐ Mule Deer
- ☐ Squirrel
- ☐ Coyote
- ☐ Turkey (in higher altitudes)
- ☐ Elk
- ☐ Rabbit
- ☐ Chipmunks
- ☐ Golden Eagle (rare sighting)

- ☐ Shrub Live Oak
- ☐ Apache Plume
- ☐ Manzanita
- ☐ Chamisa
- ☐ Cholla
- ☐ Banana Yucca
- ☐ Evening Primrose
- ☐ Prickly Pear
- ☐ Perky Sue
(sunflower family)
- ☐ Indian Paintbrush
- ☐ Pale Trumpets